



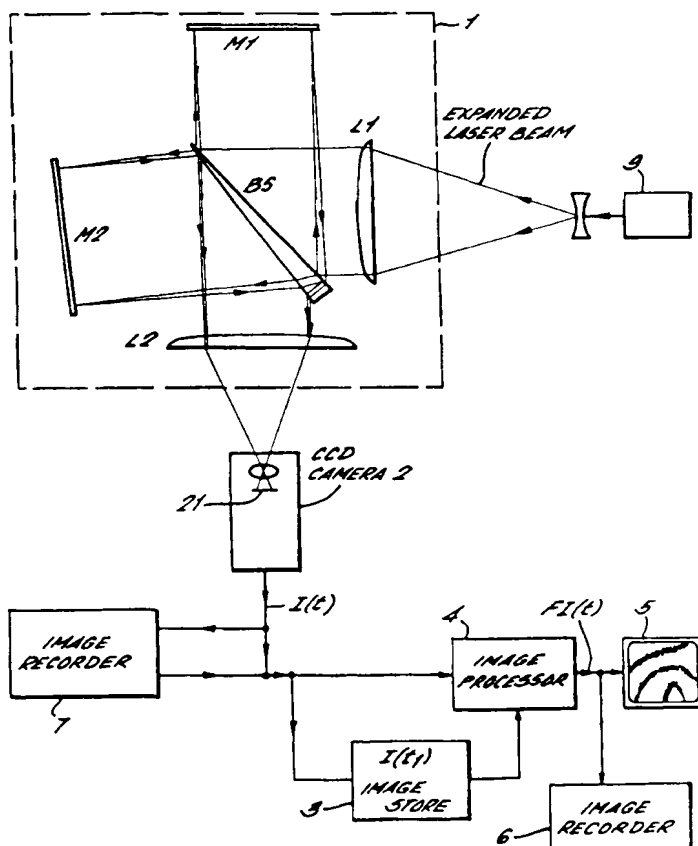
INTERNATIONAL APPLICATION PUBLISHED UNDER THE PATENT COOPERATION TREATY (PCT)

(51) International Patent Classification ⁷ : G01B 9/02		A1	(11) International Publication Number: WO 00/49364
			(43) International Publication Date: 24 August 2000 (24.08.00)
(21) International Application Number: PCT/GB00/00236 (22) International Filing Date: 27 January 2000 (27.01.00) (30) Priority Data: 9903638.6 17 February 1999 (17.02.99) GB (71) Applicant (for all designated States except US): EUROPEAN COMMUNITY represented by COMMISSION OF THE EUROPEAN COMMUNITIES [LU/LU]; Rue Alcide de Gasperi, L-2920 Luxembourg (LU). (72) Inventors; and (75) Inventors/Applicants (for US only): FORNO, Colin [GB/IT]; ISIS Istituto - TP210, C.E. Centro Commune di Ricerca, I-21020 Ispra (IT). WHELAN, Maurice [IE/IT]; ISIS Istituto - TP210, C.E. Centro Commune di Ricerca, I-21020 Ispra (IT). (74) Agent: BOULT WADE TENNANT; Verulam Gardens, 70 Gray's Inn Road, London WC1X 8BT (GB).		(81) Designated States: CA, JP, NO, US, European patent (AT, BE, CH, CY, DE, DK, ES, FI, FR, GB, GR, IE, IT, LU, MC, NL, PT, SE). Published With international search report.	

(54) Title: COMBINING INTERFERENCE FRINGE PATTERNS TO A MOIRE FRINGE PATTERN

(57) Abstract

An interferometer (1) is arranged to form a first interference fringe pattern comprising at least ten interference fringes; recording an image of said first interference fringe pattern; perturbing an optical path in the interferometer (1) to form a second interference fringe pattern comprising at least ten interference fringes; and combining an image of said second interference fringe pattern with the recorded image of the first interference fringe pattern to produce a further image comprising a moiré fringe pattern arising from a difference or differences between the first and second interference fringe patterns. The combining step involves subtraction (4) of digital images. Different wavelengths and interferometers are used: Michelson, Mach-Zehnder, Fizeau, Twyman-Green. In this new approach, all the errors of a poor quality, misaligned system are accepted and then eliminated by the combination process, producing a moiré fringe pattern. The method enables very large aperture optical systems for traditional and engineering interferometers to be constructed from inexpensive and basic components.



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PATENT COOPERATION TREATY

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INTERNATIONAL PRELIMINARY EXAMINATION REPORT

(PCT Article 36 and Rule 70)

5

Applicant's or agent's file reference REC/RGJ/P51409/001	FOR FURTHER ACTION See Notification of Transmittal of International Preliminary Examination Report (Form PCT/IPEA/416)	
International application No. PCT/GB00/00236	International filing date (day/month/year) 27/01/2000	Priority date (day/month/year) 17/02/1999
International Patent Classification (IPC) or national classification and IPC G01B9/02		
Applicant EUROPEAN COMMUNITY et al.		

1. This international preliminary examination report has been prepared by this International Preliminary Examining Authority and is transmitted to the applicant according to Article 36.


2. This REPORT consists of a total of 4 sheets, including this cover sheet.

☐ This report is also accompanied by ANNEXES, i.e. sheets of the description, claims and/or drawings which have been amended and are the basis for this report and/or sheets containing rectifications made before this Authority (see Rule 70.16 and Section 607 of the Administrative Instructions under the PCT).

These annexes consist of a total of sheets.

3. This report contains indications relating to the following items:

- I ☒ Basis of the report
- II ☐ Priority
- III ☒ Non-establishment of opinion with regard to novelty, inventive step and industrial applicability
- IV ☐ Lack of unity of invention
- V ☒ Reasoned statement under Article 35(2) with regard to novelty, inventive step or industrial applicability; citations and explanations supporting such statement
- VI ☐ Certain documents cited
- VII ☐ Certain defects in the international application
- VIII ☐ Certain observations on the international application

Date of submission of the demand 31/05/2000	Date of completion of this report 01.08.2000
Name and mailing address of the international preliminary examining authority:  European Patent Office D-80298 Munich Tel +49 89 2399 - 0 Tx 523656 epmu d Fax +49 89 2399 - 4465	Authorized officer Mielke, W Telephone No +49 89 2399 2661



**INTERNATIONAL PRELIMINARY
EXAMINATION REPORT**

International application No. PCT/GB00/00236

I. Basis of the report

1. This report has been drawn on the basis of (*substitute sheets which have been furnished to the receiving Office in response to an invitation under Article 14 are referred to in this report as "originally filed" and are not annexed to the report since they do not contain amendments.*):

Description, pages:

1-25 as originally filed

Claims, No.:

1-35 as originally filed

Drawings, sheets:

1/11-11/11 as originally filed

2. The amendments have resulted in the cancellation of:

- ☐ the description, pages:
☐ the claims, Nos.:
☐ the drawings, sheets:

3. ☐ This report has been established as if (some of) the amendments had not been made, since they have been considered to go beyond the disclosure as filed (Rule 70.2(c)):

4. Additional observations, if necessary:

III. Non-establishment of opinion with regard to novelty, inventive step and industrial applicability

The questions whether the claimed invention appears to be novel, to involve an inventive step (to be non-obvious), or to be industrially applicable have not been examined in respect of:

- ☐ the entire international application.
☒ claims Nos. 34,35.

because:

INTERNATIONAL PRELIMINARY EXAMINATION REPORT

International application No. PCT/GB00/00236

☐ the said international application, or the said claims Nos. relate to the following subject matter which does not require an international preliminary examination (*specify*):

☒ the description, claims or drawings (*indicate particular elements below*) or said claims Nos. 34,35 are so unclear that no meaningful opinion could be formed (*specify*):

see separate sheet

☐ the claims, or said claims Nos. are so inadequately supported by the description that no meaningful opinion could be formed.

☐ no international search report has been established for the said claims Nos. .

V. Reasoned statement under Article 35(2) with regard to novelty, inventive step or industrial applicability; citations and explanations supporting such statement

1. Statement

Novelty (N)	Yes:	Claims	1-33
	No:	Claims	
Inventive step (IS)	Yes:	Claims	1-33
	No:	Claims	
Industrial applicability (IA)	Yes:	Claims	1-33
	No:	Claims	

2. Citations and explanations

see separate sheet

**INTERNATIONAL PRELIMINARY
EXAMINATION REPORT - SEPARATE SHEET**

International application No. PCT/GB00/00236

Item III:

Claims 34,35 seem not to be absolutely necessary. Rule 6.2(a) PCT.

Item V:

According to figure 5 and column 5 lines 3-11 of US-A-5243542 an interference fringe pattern is combined with a reference fringe pattern of 64 fringes to a Moiré fringe pattern for adjustment purposes. Here the invention according to independent claims 1,18,23 starts by replacing the reference fringe pattern by another interference fringe pattern to allow inexpensive components, see lines 2-8 on page 5. Such a basic approach could not be determined, so that claims 1-33 are regarded to meet the criteria of article 33(2-4) PCT.

PATENT COOPERATION TREATY

09/79215
PCT

From the INTERNATIONAL SEARCHING AUTHORITY

To:

BOULT WADE TENNANT
Verulam Gardens
70 Gray's Inn Road
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UNITED KINGDOM

COMMUNICATION IN CASES FOR WHICH
NO OTHER FORM IS APPLICABLE

Date of mailing
(day/month/year)

02/06/2000

Applicant's or agent's file reference

REC/51409001

REPLY DUE

See paragraph 1 below

International application No.

PCT/GB 00/ 00236

International filing date
(day/month/year)

27/01/2000

Applicant

EUROPEAN COMMUNITY et al.

1. ☐ REPLY DUE within _____ ~~XXXX~~ days from the above date of mailing

☒ NO REPLY DUE

2. COMMUNICATION:

Please find enclosed copy of modified abstract. This copy should supersede the previous one sent.

Name and mailing address of the International Searching Authority



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Authorized officer

Mildred Condron

PATENT COOPERATION TREATY

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NOTIFICATION OF ELECTION

(PCT Rule 61.2)

From the INTERNATIONAL BUREAU

To:

Assistant Commissioner for Patents
United States Patent and Trademark
Office
Box PCT
Washington, D.C. 20231
ETATS-UNIS D'AMERIQUE

in its capacity as elected Office

Date of mailing: 24 August 2000 (24.08.00)	
International application No.: PCT/GB00/00236	Applicant's or agent's file reference: REC 51409001
International filing date: 27 January 2000 (27.01.00)	Priority date: 17 February 1999 (17.02.99)
Applicant: FORNO, Colin et al	

1. The designated Office is hereby notified of its election made:

☒ in the demand filed with the International preliminary Examining Authority on:
31 May 2000 (31.05.00)

☐ in a notice effecting later election filed with the International Bureau on:

2. The election ☒ was

☐ was not

made before the expiration of 19 months from the priority date or, where Rule 32 applies, within the time limit under Rule 32.2(b).

The International Bureau of WIPO 34, chemin des Colombettes 1211 Geneva 20, Switzerland	Authorized officer: J. Zahra
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